Exhibit A: CGR Energy and Water Audit

Energy and Water Audit

United States Consul General Residence, (Post)

Procurement 4587625

August 2015

1.0 Overview

1.1 **Building Description**: United States Consul General Residence, 1563 Matthews Avenue, Vancouver, British Columbia

Building Name and Post	Consul General Residence / Vancouver
Audit Date	2015
Building Type (office, residential, etc.)	Residence
Building Use Summary	Private Residence
Date of Last Major Renovation	Unknown
Conditioned Area (m2)	1502.75 GSM
Number of Floors	4 (Includes basement)
Design Occupancy (FTE)	14 residents / 24 guests
Typical Building Schedule Summary (business hours, continuous, seasonal, 24/7, etc.)	Continuous
Interval Data Available (Y/N)	Y
General Lighting Description	Residential
Plumbing Fixtures Description	Basement: 1 laundry tub, 1 60 gallons natural gas, hot water tank, 1 commercial ice machine, 1 laundry machine, 1 sink, 1 shower, 1 toilet First floor: 2 kitchen sink, 1 commercial dish washer, 1 toilet, 1 sink. Second floor: 3 toilets, 3 sinks, 3 showers, 1 bathtub whirlpool. Third floor: 1 toilet, 1 shower, 1 sink.
Power Service and Distribution Description	200 amps service/ 2 sub panels

Mechanical System Description	X natural gas forced air heating/cooling furnaces with X thermostats
Controls and Building Automation Description	Residential – N/A
Water Supply	¾" service line, Municipally-sourced domestic water and irrigation
Wastewater Treatment	Municipal
Fire Suppression Systems	No
Vertical and Horizontal Transportation Systems	n/a
Notes	n/a

1.2 **Buildings**:

1.2.1 Consul General Residence - RESDCR (PropID 14013), xxx GSM

1.3 BMIS Report – N/A

1.4 **Assessments**: This section identifies the assessments included in the scope of the project. Utility Data Gathering, Meter Assessment, American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Level I Audit, and ASHRAE Level II Audit):

1.4.1 **Utility Data Gathering:** The Contractor shall collect and confirm all relevant utility consumption and cost data as noted in Exhibit B and Exhibit C.

1.4.1.1 Analyze the building and site utility consumption and cost data provided by Post per the SOW section 2.3.1.

1.4.1.2 Where Tririga Real Estate Environmental Sustainability (TREES Utility Management System) data and reports are not available, obtain utility bills for each building or use monthly metered data, and summarize in the appropriate table in Exhibit C as follows, to enable data upload to the TREES Utility Management System.

1.4.1.3 For each building to be assessed, collect data for each building in a separate spreadsheet, or in multiple separate spreadsheets as noted in Exhibit C.

1.4.1.4 On a separate tab for each 12 month period, for each energy type separately and each meter/account individually (if applicable), identify the information noted on the Metered Data tabs in Exhibit C, including consumption and demand per billing or measurement period. For delivered fuel, use the appropriate table.

1.4.1.5 On a separate tab for each 12 month period, for each water meter/account individually, identify the information noted in Exhibit C, including consumption per billing or measurement period.

1.4.1.6 In the report, identify:

- Description of the utility rate structure and components, such as demand charges, power factors, taxes, fees, and peak rates.
- Currency conversion rate that was applied
- Interval for which each utility type had data available, such as monthly, bi-monthly, or quarterly, in the metering/billing period columns. This information will assist with entering accurate data into the TREES Utility Management System.
- Energy and water intensity targets based on other similar posts]

1.4.1.7 The Contractor shall complete the Utility Data Gathering report in the section as noted in Exhibit B.}

1.4.2 **Meter Assessment**: The Contractor shall use the most up-to-date version of EPAct 2005, E.O. 13423, and EISA 2007 to identify the locations, types, and sizes of meters required for compliance for facilities identified in Exhibit A.

1.4.2.1 The Contractor shall identify the locations and connections of all meter equipment, either standalone or as part of Building Automation Systems (BAS).

1.4.2.2 The Contractor shall gather additional meter information including building and connection; type of utility; meter make, model and serial number; and related characteristics.

1.4.2.3 Based upon the assessment of existing meters, the Contractor shall determine the requirements for compliant metering and associated connection characteristics for electricity, water, gas, alternative energy,

and generators, and record the information in the appropriate table in Exhibit C.

1.4.2.4 The Contractor shall provide the report of all findings including currently installed meter information, and required meter specifications, locations, characteristics, and estimated costs.

- The report shall be presented as a standalone appendix to the Energy and Water Audit Report, in the format presented in the Report Template.
- The Contractor shall also indicate the proposed location of new electricity meters on Post's existing single-line electrical drawings.}

1.4.3 **ASHRAE Level I Audits:** The Contractor shall perform an ASHRAE Level I Audit for facilities identified above, and shall provide a report in the format presented in the Report Template.

1.4.3.1 The Contractor shall perform a prototypical site walk-through of all facilities to identify existing conditions as outlined in ASHRAE's Procedures for Commercial Building Energy Audits (2011) for a Level I Audit. This will include the following tasks:

- Perform a preliminary walk-through survey of each facility.
- Meet with Post facilities and maintenance personnel.
- Perform a space function analysis.
- Estimate energy and water consumption by end use categories.
- Identify low-cost/no-cost energy conservation measures (ECMs), water conservation measures (WCMs), and renewable energy measures (REMs), and evaluate potential costs and savings related to each.
- Identify potential future capital projects based on medium- and high-cost measures, and estimate costs and savings.

1.4.3.2 In addition to the activities outlined in the ASHRAE Procedures, the Contractor shall determine an ENERGY STAR score for each facility.

1.4.3.3 The Contractor shall prepare an Audit report using the Energy and Water Audit Report Template provided in Exhibit B.

1.4.3.4 The Contractor shall enter data and recommendations for ECMs, WCMs, and REMs into the templates provided in Exhibit C or into the

relevant section of the report as per Exhibit B, and as indicated in ASHRAE's Procedures for Commercial Building Systems (2011).

- Description of operation and maintenance procedures regarding system efficiency
- Lighting types by percentage of floor area, overall estimated lighting power density, and types and number of lighting controls or switches
- List of all significant HVAC system types
- List of typical unoccupied setback/shutoff control types (schedule, outside air temp, or other) for AHUs, exhaust fans, chillers, and boilers
- Summary of any special or unusual loads, including peak and average power and consumption, operating schedules, or other pertinent data. This might include data centers, laundries, parking garages, swimming pools, security lighting, or other loads.}

1.4.4 **{ASHRAE Level II Audits:** The Contractor shall perform additional requirements for ASHRAE Level II Audits for facilities identified above, and shall provide a report in the format presented in the Report Template.

1.4.4.1 As part of the ASHRAE Level II Audit, the Contractor shall perform an ASHRAE Level I Audit as noted in Section 1.3.3 above.

1.4.4.2 The Contractor shall complete the additional tasks required for an ASHRAE Level II Audit as described in ASHRAE's Procedures for Commercial Building Energy Audits (2011). Required tasks in addition to a Level I Audit will included the following:

- Perform a detailed review of mechanical and electrical systems, including design, condition, operations, and identified problems.
- Measure current system performance against design. Focus on key operating parameters such as schedules, temperatures, ventilation rates, and light levels.
- Provide detailed breakdown of energy and water consumption by end use.
- Identify, evaluate, and prioritize all potential ECMs, WCMs, and REMs.

1.4.4.3 The Contractor shall use the latest version of DOE energy analysis software (or equivalent) to determine the energy use characteristics of the building and to calculate energy and energy cost savings for applicable ECMs and REMs.

1.4.4.4 The Contractor shall complete an audit report using the Report Template provided in Exhibit B.

1.4.4.5 In addition to the data provided as part of the Level I Audit, the Contractor shall enter Level II Audit data into the templates provided in Exhibit C: or into the relevant section of the report as per Exhibit B, and as indicated in ASHRAE's Procedures for Commercial Building Systems (2011).

1.4.4.6 In the report, the Contractor shall:

- Provide a narrative description for each recommended ECM, WCM, and REM, identifying scope, scale, schedule, impact, success indicators, and other implementation information. For each, the Contractor shall indicate whether the measure is low-/no-cost, or medium- or high-cost.
- Note ECMs, WCMs, and REMs that were rejected, with rationale.
- Recommend measurement and verification methods.
- Discuss potential capital-intensive projects that would require additional analysis beyond the scope of a Level II Audit.